

REMARKS

Introductory Comments:

Claims 1-20 are pending in the application. Claims 1-4, 7-8, 10-13 and 16-19, are rejected under 35 U.S.C. 102(e) as being anticipated by Xu et al (U.S. patent 6,363,163). Claims 5-6 and 14-15, are rejected under 35 U.S.C. 103(a) as being unpatentable over Xu et al (U.S. patent 6,363,163) in view of Song et al (U.S. patent 6,560,371). Claims 9 and 20 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. Claims 9 and 14 are cancelled. The Applicants respectfully request reconsideration of claims 1-8, 10-13, and 15-20.

In Response To The Claim Objections:

Regarding the objection to claim 9, the Applicants have amended claim 1 to incorporate the elements of claim 9 and have cancelled claim 9.

Regarding the objection to claim 20, claim 20 depends from claim 17, and the Applicants have amended claim 17 to overcome the rejections thereto. The Applicants therefore believe that claim 20 is allowable for at least this reason.

The Applicants believe that the objections to claims 9 and 20 are therefore overcome.

In Response To The 35 U.S.C. 102 Claim Rejections:

According to the Office Action, claims 1-3, 7, and 10-14 are anticipated because, regarding claim 1, Xu discloses a temporal processing controller adapted to receive a first image signal and a second image signal from a scanning unit comprises; a segmentation module adapted to isolate at least one region of interest of said first image signal and said second image signal, said segmentation module

further adapted to generate therefrom a segmentation signal; a registration module adapted to receive said segmentation signal and register said at least one region of interest, said registration module further adapted to generate therefrom a registration signal; and a comparison module adapted to receive said segmentation signal and said registration signal, said comparison module further adapted to generate therefrom an adaptive comparison signal of said first image signal and said second image signal.

In response to these rejections, Applicants amend claim 1 to include: wherein said comparison module further adapted to generate said adaptive comparison signal of said first image signal and said second image signal through an enhanced division method including $(S1*S2)/(S2*S2+\Phi)$, from claim 9. The Office Action recognizes that this is not disclosed or suggested in the prior art, and therefore, claim 1 is believed to be allowable.

Claims 2-8 depend from claim 1 and are believed to be allowable for at least the aforementioned reason.

Regarding claim 10, the Office Action alleges that it is rejected for similar reasons as claim 1. In response to this rejection, claim 10 is amended to include the limitations of claim 14. Claim 14 was rejected over a combination of references, and the response to that rejection will be discussed in the following section. The Applicants believe, however, that the rejection of claim 10 as anticipated by Xu is hereby overcome. Claims 11-13, and 15-16 depend from claim 10, and the rejections under 102(e) for those claims are also believed hereby overcome.

Claims 17-19 are also rejected as anticipated by Xu. In response to this rejection, the Applicants amend claim 17 to include the elements of claims 4-5. The

rejection under 102(e) is therefore believed to be overcome. Claims 18-20 depend from the amended claim 17 and are believed to be allowable for at least this reason.

In Response To The 35 U.S.C. 103(a) Claim Rejections:

Claims 5-6 and 14-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Xu et al. in view of Song et al. Claims 5-6 depend from the amended claim 1 and are believed to be allowable for at least this reason. However, claim 17 has been amended to include the elements of claim 5, so the rejection thereof will be addressed herein. Claim 14 is cancelled, and claim 10 is amended to include the elements thereof, so the rejection of claim 14 will also be discussed herein.

Regarding claims 5 (and therefore the amended claim 17) and 14 (and therefore the amended claim 10), the Office Action alleges Xu discloses a methodology for analyzing the ROIs that selected the distribution of horizontal and vertical shifts are determined using cross-correction, and the fitted distribution is used by warping circuit to produce the subtract image. The Office Action recognizes that Xu does not explicitly state "pyramidal logic designed such that a different cost function is adapted to highlight changes between said first image signal and said second image signal."

According to the Office Action, Song teaches the illumination of changes, an example of a cost function could involve a bit-wise XOR operation on the M-ary levels in the pyramid, which can be implemented as a fast method on certain architectures.

The Applicants submit that it would not have been obvious to combine the Xu and Song references to arrive at the present invention. No reason is shown why one of ordinary skill in the art would modify the Xu and Song references as the Office Action proposes. The references are not pertinent to the problem of

highlighting changes between a first image signal and a second image signal for medical temporal imaging, as are the claims.

“Obviousness cannot be established by combining the teachings of the prior art to produce the claimed invention, absent some teaching, suggestion or incentive supporting the combination.” ACS Hospital Systems, Inc. v. Montefiore Hospital, 732 F.2d 1672, 1577, 221 USPQ 929, 933 (Fed.Cir. 1984). Even if all the elements of Applicant's invention are disclosed in various prior art references, the claimed invention taken as a whole cannot be said to be obvious without some reason given in the prior art why one of ordinary skill would have been prompted to combine the teachings of the references to arrive at the claimed invention. Therefore, because no teaching or suggestion is found in any of the references to combine the temporal subtraction of medical images system of Xu with the non-medical motion estimation system of Song, claims 14 (10) and 17 (5) are believed to be allowable.

The Xu reference is directed to a temporal subtraction method for determining time interval changes in a patient (Abstract.), as is typical for imaging systems. More importantly, however, Xu does not disclose or teach pyramidal logic designed such that a different cost function is adapted to highlight changes between two image signals, as recited in claims 10 and 17. Instead, the Xu system is conventional in that it includes generating a subtracted image or result of two temporally displaced images. (Column 10, Lines 62-67.)

The Song reference is directed to a conventional system for enhancing accuracy of motion estimation methods. (Column 2, Lines 35-39.) Song, however, does not disclose or teach the use of the motion estimation system for medical imaging. Song also does not teach or suggest that application of the Song system

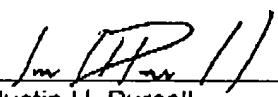
would be in any way beneficial to medical imaging, as is the claimed system. Instead, Song teaches estimation of motion for use in compressing video files such that redundant images do not need to be saved for any given video sequence. It would not, therefore, have been obvious to combine the Song reference with the Xu reference as the Office Action proposes.

Claims 10 and 17 are believed to be allowable for at least the aforementioned reasons. Claims 11-13, 15-16, and 18-20 depend from claims 10 and 17 and are also believed to be allowable for at least the aforementioned reasons.

Conclusions:

In view of the aforementioned remarks, it is respectfully submitted that all pending claims are in a condition for allowance. A notice of allowability is therefore respectfully solicited. Please charge any fees required in the filing of this amendment to Deposit Account 07-0845.

Respectfully submitted,

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